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ABSTRACT

This follow-up study assessed the effects of two different intervention strategies on the reading, language, and intellectual development of preschool children who participated in a North Carolina Head Start program during the period from 1968 to 1969. Children in the experimental group received structured language arts instruction in the first grade, through the Sullivan Reading Readiness Program, the Sullivan Reading Program, and the Buchanan Readiness in Language Arts Program, while children in the control group received no structured intervention. Data revealed that children exposed to the structured conditions did not receive significantly different scores on a battery of tests conducted at the end of the first-grade year than did children who received only the Head Start experience. (KS)

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TULANE UNIVERSITY

Early Childhood Research Center

Shuell H. Jones, Ed.D.

Center Director

Head Start Follow Through

Program Intervention in Reading Readiness and Reading

Annual Report to the

Office of Economic Opportunity

Number CG-9939 A/O

August 31, 1970

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Head Start Follow Through

Program Intervention in Reading Readiness and Reading

In 1968-1969 an intervention in language arts readiness study was conducted by the University of South Carolina, University of Texas and Tulane University. Children enrolled in Head Start participated in this study. The experimental groups were administered the Buchanan Readiness in Language Arts Program plus certain supplementary material.[1] The control classes did not receive a structured readiness in language arts program. All classes in 1968-1969 were monitored to insure the proper program was being administered, with the exception of one control class which was not monitored.

The Tulane University Early Childhood Research Center planned to follow through in 1969-1970 with an intervention study conducted with the same sample children who participated in the 1968-1969 study. Hurricane Camille which devastated the Mississippi Gulf Coast, changed the Tulane Center's plans.

The University of South Carolina had identified and obtained data on Head Start children in North Carolina during the 1968-1969 study and these children were selected for Tulane's 1969-1970 Follow Through Study.

Nature of the Problem

The nature of the problem is implied by the following questions:

A. Will children who have had previous Head Start Training in a specific area

[1]Head Start Evaluation and Research Center, Shuell H. Jones, Director
Annual Report to O E O, August 31, 1969.

(i.e., readiness in language arts) perform significantly different in reading achievement than children who have had Head Start experience but who have not been subjected to a structured readiness in language arts program?

B. Will children who have had Head Start experience and who have been administered a structured language arts program and upon entering first grade are introduced into a reading readiness program and then into a programmed reading program which incorporates the findings of structured linguistics, educational psychology and programming, which are specifically developed by the author to compliment each other in logical sequence, achieve greater results in related areas (e.g., reading, language and intellectual development) than those children who have had both previous Head Start and readiness in language arts training, but who are placed in a traditional reading readiness and reading program upon entering first grade?

C. Will children who have had Head Start experience, but who have not been administered a structured readiness in language arts program do as well in related areas (e.g., reading, language and intellectual development) if they receive the readiness in language arts material in first grade and then move into reading readiness and programmed reading, as those pupils who have had both Head Start and readiness in language arts training and will be introduced into the reading readiness program upon entering first grade and upon completion will be taught to read by using programmed reading materials?

D. Will a reading program which permits pupils to move ahead at their own speed and ability improve achievement in reading and related areas?

E. Will formal and intensive teacher training within a limited area (i.e., reading) improve instruction (as measured by student achievement) in that area and in related areas?

Intervention Procedures

The Sullivan Reasing Readiness Program and the Sullivan Reading Program constituted the prime element of the independent variable. These programs were administered to all experimental groups. The control groups did not receive instruction based on the Sullivan Reading Readiness or Reading Program. The Cynthia Buchanan Language Program was administered to one experimental group which did not receive the material in Head Start.

There were seven classes involved in the study. The experimental and control groups are listed below with materials and extent of teacher training used with each.

Experimental Group I: This group was composed of one class, identified on Tables as Class Number 1.

A. Program: the Buchanan Language Program was administered, as well as the Sullivan Readiness and the Sullivan Reading Program.

1. Readiness in Language Arts.

The Readiness in Language Arts program is entirely teacher-administered. All student responses are oral.

The teacher stands the demonstration "Giant Book" in its easel at the front of the class. Following her specially prep red teacher's manual, she explains the content of each page, elicits responses, and provides a check for each response. Although each step of the program is carefully organized, the teacher is free to stop at any moment to expand a concept, answer a question, or introduce new information. She may cover as many pages as she wishes. She may review at her discretion by simply turing back the pages.

In Readiness in Language Arts the children are first taught the most basic concepts: directions, spatial relations, and color.

Then, step-by-step, the children are introduced to the alphabet and letter sounds. at the end of the program the children will be reading--not by memorizing the words, but by understanding the sound-symbol relationships of English.

Readiness in Language Arts has as its specific objectives the teaching of:

A. Basic Skills

Directions: Left and right, up and down, top and bottom, under and over, first and last, front and back.

Spatial relations: a straight line, a curved line, a circle, a square.

Colors: The children learn the colors one-by-one.

B. The Alphabet

When the children have a firm background in basic concepts, the letters of the alphabet are introduced--first small letters, then capital letters.

C. Reading and Spelling

The children are first taught the short vowel sounds for a and the sounds /n/, /p/, and /t/ for n, p, and t. As each sound-symbol relationship is taught the child learns to listen for the sound in familiar words. He relates it to the letter that represents the sound.

When these sound-symbols are mastered, the five short vowel sounds and the common sounds of the consonants are taught in a one-to-one linguistic progression--that is, only one sound for each symbol. This method builds confidence. At the end of the program the child has a reading and spelling reportoire of 126 two- and three- letter words.

2. Sullivan Reading Readiness

These materials prepare a beginning student who already knows some basic concepts for work in the Sullivan Reading program. Reading Readiness has four textbooks with these specific objectives:

Book A: The first book of this series is entirely teacher-administered. Step-by-step the teacher leads the student through the program to the point at which he can work at his own rate.

First, the student reviews the numbers 1 through 10, which later permits him to check his own work in the program and receive immediate positive feedback. Then the student learns the four vowels and six consonants in a one-to-one linguistic progression: only one sound is taught for each letter.

In this manner the student builds a firm foundation of words with regular sound-symbol relationships. Consquently, he perceives that there is a relationship between written letters and sounds. At the end of Book A, the student will have learned to read and spell 33 words.

Book B: The student now begins to work individually at his own rate of speed. The material taught in Book A is reviewed. The student is introduced to two new letters and 8 new words.

Book C: The student reviews what he has learned in the previous books. He learns eight new letters and 36 new words.

Book D: This is the first book in which words are combined to form syntactic patterns. They start with the very simple phrase pattern of article-noun and gradually build toward more complex patterns.

To illustrate, first the student learns the phrase "a man." By the end of the book he reads complete sentences like "A pup can nap in a box." In Book D, the student learns four additional letters and 21 new words.

3. The Sullivan Reading Program

Twenty textbooks and 28 correlated readers make up the Sullivan Reading Program. The programmed textbooks perform a "decoding" process for the student, training him in the elements of our language. At the end of Series I (Textbooks 1, 2, 3, and 4) the student has a perfect familiarity with the short vowels, the individual consonants, and the important initial and final clusters of two and three consonants. He has a spelling and writing vocabulary of 750 words; and his knowledge of English sound-letter relationships permits him to read thousands of other regular words.

Following logically and sequentially from Series I are Series II, III, IV, and V, sixteen aditional books in which the complexity of the sound-symbol relationship is gradually increased.

Irregular and polysyllabic words and more complex sentences are introduced. The student receives intensive training after each new step is taken, so he is always confident as he moves ahead.

A series of graduated high interest and low vocabulary readers supplements the Sullivan Reading program. These readers contain amusing stories with lively illustrations directly correlated to words meanings. The readers are carefully numbered and coordinated with the vocabulary in the accompanying textbooks. They provide additional reading experience in story form and they give the students the reward of successfully using what they have learned.

B. Teacher Training: The training consisted of two days for clarifying the Buchanan Manual, two days on the Sullivan Readiness Program and three days on the Sullivan Reading Program. All teacher training was conducted by the Tulane University Early Childhood Research Center. The class was monitored.

Experimental Group II: This group was composed of two classes; identified in Tables as Classes Numbered 2 and 3.

A. Program: The Sullivan Reading Readiness and the Sullivan Reading Program was administered. Material content is outlined under experimental group I program.

B. Teacher Training: The training consisted of two days training on the Sullivan Readiness program and three days training on the Sullivan Reading Program All teacher training was conducted by the Tulane University Early Childhood Research Center. The classes were monitored.

Control Group I: This group was composed of three classes; identified in Tables as Classes Numbered 5, 6, and 7. These classes did not receive the Sullivan Readiness, nor the Sullivan Reading Program. These classes have received the Buchanan Language Program and have had Head Start training.

These classes were not monitored.

Control Group II: This group was made up of one class; identified in Table as Class Number 4. This class did not receive the Sullivan Reading Readiness, nor the Sullivan Reading Program. This class has had Head Start experience, but did not receive training in the Buchanan Readiness in Language Arts Program. This class was not monitored.

To allow for attrition among teachers, two teachers were trained for each experimental class. Therefore, six teachers were trained.

In order to insure that each teacher in the experimental classes is using the designated method, a monitor was trained to monitor all experimental classes. The monitor was certified by the Tulane University Early Childhood Research Center as having attained a pre-established level of proficiency before being released from training. The monitor was given a rating scale and each experimental class was monitored twice a week and a weekly report was sent to the Early Childhood Research Center by the monitor.

A. Research Questions:

1. Will children with Head Start experience and readiness in language arts score significantly different on the tests administered than those children who have Head Start experience, but no experience in the structured Buchanan Readiness in Language Arts Program? This compared control group I with control group II as shown in Table I.

2. Will children with Head Start experience and readiness in language arts, and who were administered the Sullivan Readiness and Reading Program score significantly different on the tests administered than those children who have had both Head Start experience and readiness in language arts, but who will not receive the Sullivan

The data in Table I present a comparison of children having had Head Start experience and a readiness in language arts program, with children having had Head Start experience but no training in the structured Buchanan Readiness in Language Arts program. Control Group 1 and Control Group 2 did not score significantly different on the tests administered.

TABLE I

Comparison

Control Groups 1 with Control Group 2

STANFORD-BINET IQ

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
5	C 1	15	88.66	8.32	84.93	5.71
6	C 1	9	90.88	12.39	87.22	10.49
7	C 1	8	91.50	11.17	91.25	11.11
4	C 2	12	89.75	8.94	86.33	9.51

TABLE I

Comparison

Control Groups 1 with Control Group 2

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
			GATES-MACGINITIE READING TESTS			
5	C 1	15	17.06	5.36	39.80	15.54
6	C 1	9	19.88	4.51	40.11	13.95
7	C 1	8	19.87	3.87	30.25	11.09
4	C 2	12	20.83	5.23	46.58	12.98
			METROPOLITAN READINESS TESTS			
5	C 1	15	49.40	13.18	60.00	11.12
6	C 1	9	49.33	11.82	60.88	9.96
7	C 1	8	45.00	11.31	54.50	11.14
4	C 2	12	52.25	9.29	61.75	8.98
			STANFORD-ACHIEVEMENT TEST			
5	C 1	15	58.40	11.13	95.20	27.01
6	C 1	9	62.11	6.19	99.00	21.28
7	C 1	8	59.50	8.15	81.50	17.18
4	C 2	12	63.91	8.55	96.66	17.09

Readiness and Sullivan Reading material? This compared experimental group II with control group I; as shown in Table II.

3. Will children who have had both Head Start experience and readiness in language arts and receive the Sullivan Reading Readiness and the Sullivan Reading Program score significantly different on the tests administered than those children who have had only Head Start experience and have not received the readiness in language arts, the Sullivan Reading Readiness, nor the Sullivan Reading material? This compares experimental groups I and II with control group II; as shown in Table III.

4. Will children who have had both Head Start experience and readiness in language arts experience and who have been administered Sullivan Reading Readiness and Sullivan Reading material score significantly different on tests administered than those children who have had Head Start experience, but have received the readiness in language arts material in first grade and upon completion were administered the Sullivan Reading Readiness and the Sullivan Reading materials. This compares experimental groups I and II; as shown in Table IV.

B. Testing:

a. The following tests were administered to both the experimental and control groups:

1. Stanford-Binet
2. Readiness Test--Metropolitan
3. Gates-MacGinitie
4. Stanford Achievement Test: Primary I

NOTE: No test was selected which did not have norms and which had not been previously field tested to established reliability. The Stanford-Binet was administered by the Tulane University Early Childhood Research Center's

The data in Table II show two groups of children with the same experience in Head Start and readiness in language arts, but one group continues in the Sullivan Readiness and Reading Program and one does not receive this treatment. No significant difference was found on test scores administered to these children.

TABLE II

Comparison

Experimental Groups 2 with Control Groups 1

STANFORD-BINET IQ

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
2	E 2	16	88.42	8.50	88.75	9.53
3	E 2	12	88.75	8.52	88.16	7.98
5	C 1	15	88.66	8.32	84.93	5.71
6	C 1	9	90.88	12.39	87.22	10.49
7	C 1	8	91.50	11.17	91.25	11.11

TABLE II

Comparison

Experimental Groups 2 with Control Groups 1

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
			GATES-MACGINITIE READING TESTS			
2	E 2	16	14.43	5.20	36.62	16.32
3	E 2	12	18.91	5.83	36.00	10.67
5	C 1	15	17.06	5.36	39.80	15.54
6	C 1	9	19.88	4.51	40.11	13.95
7	C 1	8	19.87	3.87	30.25	11.09
			METROPOLITAN READINESS TESTS			
2	E 2	16	42.62	12.83	60.87	12.59
3	E 2	12	47.83	11.06	64.58	10.37
5	C 1	15	49.40	13.18	60.00	11.12
6	C 1	9	49.33	11.82	60.88	9.96
7	C 1	8	45.00	11.31	54.50	11.14
			STANFORD-ACHIEVEMENT TEST			
2	E 2	16	51.68	12.52	89.43	19.36
3	E 2	12	61.00	5.25	81.58	13.27
5	C 1	15	58.40	11.13	95.20	27.01
6	C 1	9	62.11	6.19	99.00	21.28
7	C 1	8	59.50	8.15	81.50	17.18

Data on Table III compare children who have had Head Start experience, readiness in language arts, Sullivan Reading Readiness and the Sullivan Reading Program, with children who have had Head Start experience but who have received a traditional first grade reading program. Experimental Group 1, Experimental Group 2 and Control Group 2 did not score significantly different on the tests administered.

TABLE III

Comparison

Experimental Groups 1 and 2 with Control Group 2

STANFORD-BINET IQ

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	89.00	10.58	90.69	8.22
2	E 2	16	88.42	8.50	88.75	9.53
3	E 2	12	88.75	8.52	88.16	7.98
4	C 2	12	89.75	8.94	86.33	9.51

TABLE IX

Comparison

Experimental Groups 1 and 2 with Control Group 2

Class ID Number	GROUP:	N:	Fall 19[illegible] (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
			GATES-MACGINITIE READING TESTS			
1	E 1	13	11.38	[illegible].13	29.07	5.99
2	E 2	16	14.43	5.20	35.62	16.32
3	E 2	12	18.91	5.83	36.00	10.67
4	C 2	12	20.83	5.23	46.58	12.98
			METROPOLITAN READINESS TESTS			
1	E 1	13	40.38	11.01	66.92	8.21
2	E 2	16	42.62	12.83	60.87	12.59
3	E 2	12	47.83	11.06	64.58	10.37
4	C 2	12	52.25	9.29	61.75	8.98
			STANFORD-ACHIEVEMENT TEST			
1	E 1	13	43.69	12.93	76.53	14.68
2	E 2	16	51.68	12.52	89.43	19.36
3	E 2	12	61.00	5.25	81.58	13.27
4	C 2	12	63.91	8.55	96.66	17.09

The data on Table IV compare children who have had readiness in language arts experience in the Head Start program and who have been administered the Sullivan Reading Readiness and Sullivan Reading material in first grade, with children who have had Head Start experience but who were administered the Buchanan Reading Readiness program and the Sullivan Readiness and Reading program in first grade. The children in Experimental Groups 1 and 2 did not score significantly different on tests administered.

TABLE IV

Comparison

Experimental Groups 1 and 2

STANFORD-BINET IQ

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	89.00	10.58	90.69	8.22
2	E 2	16	88.42	8.50	88.75	9.53
3	E 2	12	88.75	8.52	88.16	7.98

TABLE IV

Comparison

Experimental Groups 1 and 2

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
			GATES-MACGINITIE READING TESTS			
1	E 1	13	11.38	6.13	29.07	5.99
2	E 2	16	14.43	5.20	36.62	16.32
3	E 2	12	18.91	5.83	36.00	10.67
			METROPOLITAN READINESS TESTS			
1	E 1	13	40.38	11.01	66.92	8.21
2	E 2	16	42.62	12.83	60.87	12.59
3	E 2	12	47.83	11.06	64.58	10.37
			STANFORD-ACHIEVEMENT TEST			
1	E 1	13	43.69	12.93	76.53	14.68
2	E 2	16	51.68	12.52	89.43	19.36
3	E 2	12	61.00	5.25	81.58	13.27

team of professional testers, who were checked for quality control. The readiness and reading tests were administered by the monitor after receiving training to administer these tests by the Tulane University Early Childhood Research Center

C. Method of Data Analysis:

The data were treated through means of the analysis of covariance technique.

D. Attendance:

Attendance records for each of the experimantal classes were carefully maintained. This is obviously an important control with respect to the interval validity of the research. Attendance mean for E 1 - 169; E 2 (Class #2)-173, and E 2 (Class #3)-168.

CONCLUSIONS

Children with Head Start experience do not score significantly different on tests administered at the end of first grade whether they did or did not receive a structured readiness in language arts program while participating in Head Start.

Children administered a structured readiness in language arts program in Head Start and the Sullivan Reading Readiness and Reading material in first grade did not score significantly different than children who have had both Head Start and readiness in language arts experience, but who did not receive the Sullivan Reading Readiness or Reading material in first grade.

Children with experience in readiness in language arts and Head Start and who received the Sullivan Reading Readiness and Sullivan Reading materials in first grade did not score significantly different than those children having Head Start experience and were not administered the Buchanan or the Sullivan materials.

Children who had both the Buchanan Readiness in Language Arts Program and Head Start and who were administered the Sullivan materials in first grade did not score significantly different than those children who have had Head Start experience and received the Buchanan and the Sullivan materials in first grade.

Although test results show no significant difference between children receiving the various interventions the researcher would have liked to have continued this study through second grade. This researcher conducted a three year study on programmed reading which showed children in the lower quartile of the second grade reading tests using programmed reading to have a six month higher grade score in both word recognition and paragraph meaning than children administered the traditional reading program.[1]

[1]Nation's Schools Volume 78 No. 1 - July 1966 pp. 39-40

TABLES

of

ANALYSIS OF COVARIANCE

for

STANFORD-BINET INTELLIGENCE SCALE

GATES-MACGINITIE READING TESTS
Primary A

Subtest 1	Vocabulary
Subtest 2	Comprehension
TOTAL	

METROPOLITAN READINESS TESTS

Subtest 1	Word Meaning
Subtest 2	Listening
Subtest 3	Matching
Subtest 4	Alphabet
Subtest 5	Numbers
Subtest 6	Copying
TOTAL	

STANFORD-ACHIEVEMENT TEST
Primary I Battery

Subtest 1	Word Reading
Subtest 2	Paragraph Meaning
Subtest 3	Vocabulary
Subtest 4	Spelling
Subtest 5	Word Study Skills
Subtest 6	Arithmetic
TOTAL	

STANFORD-BINET INTELLIGENCE SCALE

IQ

Class ID Number	GROUP:	N:	Spring 1969 Mean	Spring 1969 S.D.	Fall 1969 (PRE) Mean	Fall 1969 (PRE) S.D.	Fall 1969 (PRE) Mean Age	Fall 1969 (PRE) S.D.	Spring 1970 (POST) Mean	Spring 1970 (POST) S.D.	Spring 1970 (POST) Mean Age	Spring 1970 (POST) S.D.
1	E 1	13	93.76	6.89	89.00	10.58	75.30	1.84	90.69	8.22	83.30	1.84
2	E 2	16	88.85	11.68	88.42	8.50	74.56	1.78	88.75	9.53	82.56	1.78
3	E 2	12	90.09	8.33	88.75	8.52	75.91	2.10	88.16	7.98	83.91	2.10
4	C 2	12	92.83	12.56	89.7[illegible]	8.94	76.16	1.94	86.33	9.51	84.16	1.94
5	C 1	15	87.00	9.55	88.6[illegible]	8.32	75.26	2.05	84.93	5.71	83.26	2.05
6	C 1	9	90.88	9.03	90.88	12.39	75.00	2.06	87.22	10.49	83.00	2.06
7	C 1	8	88.00	10.02	91.50	11.17	74.50	1.69	91.25	11.11	82.50	1.69
TOTAL EXPERIMENTAL			90.89	9.32	88.71	9.01	75.19	1.93	89.19	8.54	83.19	1.93
TOTAL CONTROL			89.56	10.38	89.93	9.65	75.31	1.98	86.93	8.91	83.91	1.98
ALL GROUPS COMBINED			90.18	9.86	89.36	9.31	75.25	1.95	88.02	8.76	83.25	1.95

GATES-MACGINITIE SUBTEST 1

Vocabulary

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	9.07	4.42	18.00	4.28
2	E 2	16	8.93	2.86	23.25	10.78
3	E 2	12	10.66	2.60	24.08	7.32
4	C 2	12	12.75	3.33	28.58	7.47
5	C 1	15	11.40	4.29	26.60	11.56
6	C 1	9	12.66	2.69	26.11	10.31
7	C 1	8	12.50	1.41	20.00	9.10
TOTAL EXPERIMENTAL			9.48	3.37	21.82	8.42
TOTAL CONTROL			12.22	3.29	25.84	9.99
ALL GROUPS COMBINED			10.90	3.59	23.90	9.43

GATES-MACGINITIE SUBTEST 2

Comprehension

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	2.30	2.81	11.07	4.53
2	E 2	16	5.50	3.38	13.37	6.10
3	E 2	12	7.41	3.17	11.91	5.35
4	C 2	12	8.08	2.23	18.00	6.36
5	C 1	15	5.66	3.20	13.20	5.24
6	C 1	9	7.22	3.19	14.00	4.66
7	C 1	8	7.37	3.29	10.25	2.49
TOTAL EXPERIMENTAL			5.04	3.69	12.22	5.38
TOTAL CONTROL			6.95	3.04	14.13	5.62
ALL GROUPS COMBINED			6.03	3.48	13.21	5.56

GATES-MACGINITIE READING TESTS

TOTAL

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Mean Age	S.D.	Spring 1970 (POST) Mean	S.D.	Mean Age	S.D.
1	E 1	13	11.38	6.13	76.30	1.84	29.07	5.99	83.38	1.71
2	E 2	16	14.43	5.20	75.56	1.78	36.62	16.32	82.56	1.78
3	E 2	12	18.91	5.83	76.91	2.10	36.00	10.67	83.91	2.10
4	C 2	12	20.83	5.23	78.16	1.94	46.58	12.98	84.16	1.94
5	C 1	15	17.06	5.36	76.33	2.09	39.80	15.54	83.26	2.05
6	C 1	9	19.88	4.51	76.00	2.06	40.11	13.95	83.00	2.06
7	C 1	8	19.87	3.87	75.50	1.69	30.25	11.09	82.50	1.69
TOTAL EXPERIMENTAL			14.78	6.30	76.19	1.93	34.04	12.40	83.22	1.90
TOTAL CONTROL			19.18	5.01	76.61	2.15	39.97	14.42	83.31	1.98
ALL GROUPS COMBINED			17.05	6.05	76.41	2.05	37.11	13.73	83.27	1.93

METROPOLITAN SUBTEST 1

Word Meaning

Class ID Number	GROUP:	N:	Spring 1969 Mean	Spring 1969 S.D.	Fall 1969 (PRE) Mean	Fall 1969 (PRE) S.D.	Spring 1970 (POST) Mean	Spring 1970 (POST) S.D.
1	E 1	13	5.46	2.18	4.23	1.58	6.23	1.30
2	E 2	16	4.64	1.33	5.37	1.58	4.43	2.39
3	E 2	12	5.70	1.63	4.66	1.67	5.58	1.83
4	C 2	12	6.16	1.52	5.66	1.61	5.75	2.17
5	C 1	14	4.85	1.23	5.13	2.20	5.33	2.16
6	C 1	8	5.87	1.45	4.22	2.10	4.88	2.42
7	C 1	8	5.25	0.88	4.25	1.58	4.87	2.16
TOTAL EXPERIMENTAL			5.21	1.76	4.80	1.64	5.34	2.04
TOTAL CONTROL			5.50	1.38	4.93	1.95	5.27	2.17
ALL GROUPS COMBINED			5.36	1.57	4.87	1.80	5.30	2.09

METROPOLITAN SUBTEST 2

Listening

Class ID Number	GROUP:	N:	Spring 1969 Mean	Spring 1969 S.D.	Fall 1969 (PRE) Mean	Fall 1969 (PRE) S.D.	Spring 1970 (POST) Mean	Spring 1970 (POST) S.D.
1	E 1	13	9.38	2.46	9.76	1.87	10.07	1.75
2	E 2	16	9.14	2.41	9.56	2.65	11.37	2.15
3	E 2	12	8.70	1.41	11.58	2.61	9.91	2.42
4	C 2	12	9.00	2.92	9.66	2.30	10.91	1.73
5	C 1	14	8.85	1.51	9.13	3.35	11.73	2.25
6	C 1	9	7.62	1.50	10.55	1.50	10.22	2.38
7	C 1	8	7.87	1.80	8.37	1.76	10.37	1.59
TOTAL EXPERIMENTAL			9.10	2.17	10.22	2.52	10.53	2.18
TOTAL CONTROL			8.47	2.07	9.43	2.54	10.95	2.06
ALL GROUPS COMBINED			8.77	2.13	9.81	2.55	10.75	2.12

METROPOLITAN SUBTEST 3

Matching

Class ID Number	GROUP:	N:	Spring 1969 Mean	S.D.	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	6.15	1.90	6.53	4.03	10.76	3.32
2	E 2	16	6.14	1.29	5.50	3.54	8.75	3.69
3	E 2	12	7.10	2.42	6.08	2.96	10.83	1.19
4	C 2	12	6.00	2.29	6.25	3.36	9.16	3.04
5	C 1	15	7.64	2.13	8.00	3.00	10.66	2.55
6	C 1	9	8.75	1.66	5.11	3.82	10.00	2.34
7	C 1	8	8.25	2.65	5.12	3.68	7.25	3.65
TOTAL EXPERIMENTAL			6.40	1.86	6.00	3.49	10.00	3.13
TOTAL CONTROL			7.50	2.37	6.40	3.50	9.50	3.03
ALL GROUPS COMBINED			6.98	2.20	6.21	3.48	9.74	3.07

METROPOLITAN SUBTEST 4

Alphabet

Class ID Number	GROUP:	N:	Spring 1969 Mean	Spring 1969 S.D.	Fall 1969 (PRE) Mean	Fall 1969 (PRE) S.D.	Spring 1970 (POST) Mean	Spring 1970 (POST) S.D.
1	E 1	13	6.00	2.67	4.53	3.07	15.69	0.48
2	E 2	16	11.35	4.73	11.00	5.04	14.93	2.97
3	E 2	12	13.20	2.70	12.25	5.10	15.50	1.44
4	C 2	12	9.58	4.68	12.33	3.39	15.66	0.49
5	C 1	15	12.50	2.76	13.73	3.78	15.13	2.06
6	C 1	9	14.50	1.69	14.22	2.16	15.00	1.11
7	C 1	8	13.62	2.82	14.37	1.84	15.12	0.64
TOTAL EXPERIMENTAL			9.97	4.65	9.31	5.53	15.34	2.02
TOTAL CONTROL			12.26	3.69	13.56	3.11	15.25	1.34
ALL GROUPS COMBINED			11.18	4.29	11.51	4.91	15.29	1.69

METROPOLITAN SUBTEST 5

Numbers

Class ID Number	GROUP:	N:	Spring 1969 Mean	Spring 1969 S.D.	Fall 1969 (PRE) Mean	Fall 1969 (PRE) S.D.	Spring 1970 (POST) Mean	Spring 1970 (POST) S.D.
1	E 1	13	7.69	2.56	8.07	3.12	14.07	2.53
2	E 2	16	7.78	1.92	7.50	2.30	13.43	4.08
3	E 2	12	7.70	2.71	8.41	1.44	14.08	4.05
4	C 2	12	8.41	2.46	9.75	3.62	13.41	2.71
5	C 1	15	7.85	1.61	8.00	2.42	11.46	3.52
6	C 1	9	8.25	2.49	9.33	3.60	12.55	2.78
7	C 1	8	8.37	2.97	8.62	3.06	11.12	4.22
TOTAL EXPERIMENTAL			7.73	2.31	7.95	2.37	13.82	3.57
TOTAL CONTROL			8.19	2.25	8.86	3.12	12.15	3.33
ALL GROUPS COMBINED			7.97	2.28	8.42	2.80	12.96	3.53

METROPOLITAN SUBTEST 6

Copying

Class ID Number	GROUP:	N:	Spring 1969 Mean	Spring 1969 S.D.	Fall 1969 (PRE) Mean	Fall 1969 (PRE) S.D.	Spring 1970 (POST) Mean	Spring 1970 (POST) S.D.
1	E 1	13	2.38	1.80	7.23	3.49	10.07	3.30
2	E 2	16	1.85	1.83	3.68	3.02	8.37	3.93
3	E 2	12	2.60	2.27	4.83	2.20	8.66	3.25
4	C 2	12	3.91	1.67	8.58	2.57	6.91	2.90
5	C 1	15	2.14	1.87	5.40	2.97	5.66	3.10
6	C 1	9	2.12	2.03	5.88	4.13	8.22	2.43
7	C 1	8	1.62	1.92	4.25	3.24	5.75	2.12
TOTAL EXPERIMENTAL			2.24	1.92	5.14	3.27	9.00	3.54
TOTAL CONTROL			2.54	2.00	6.15	3.46	6.54	2.85
ALL GROUPS COMBINED			2.40	1.95	5.67	3.39	7.72	3.41

METROPOLITAN READINESS TESTS

TOTAL

Class ID Number	GROUP:	N:	Spring 1969 Mean	Spring 1969 S.D.	Fall 1969 (PRE) Mean	Fall 1969 (PRE) S.D.	Mean Age	S.D.	Spring 1970 (POST) Mean	Spring 1970 (POST) S.D.	Mean Age	S.D.
1	E 1	13	37.07	5.46	40.38	11.01	76.30	1.84	66.92	8.21	83.38	1.71
2	E 2	16	40.92	8.20	42.62	12.83	75.56	1.78	60.87	12.59	82.56	1.78
3	E 2	12	45.00	7.64	47.83	11.06	76.91	2.10	64.58	10.37	83.91	2.10
4	C 2	12	42.25	9.21	52.25	9.29	78.16	1.94	61.75	8.98	84.16	1.94
5	C 1	15	43.85	6.16	49.40	13.18	76.33	2.09	60.00	11.12	83.26	2.05
6	C 1	9	47.12	6.72	49.33	11.82	76.00	2.06	60.88	9.96	83.00	2.06
7	C 1	8	45.00	5.07	45.00	11.31	75.50	1.69	54.50	11.14	82.50	1.69
TOTAL EXPERIMENTAL			40.67	7.66	43.43	11.87	76.19	1.93	63.87	10.77	83.22	1.90
TOTAL CONTROL			44.23	7.06	49.36	11.46	76.61	2.15	59.65	10.30	83.31	1.98
ALL GROUPS COMBINED			42.56	7.52	46.50	11.96	76.41	2.05	61.69	10.68	83.27	1.93

STANFORD-ACHIEVEMENT SUBTEST 1

Word Reading

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	5.92	4.80	12.92	1.93
2	E 2	16	8.50	4.03	14.25	2.35
3	E 2	12	11.50	3.50	12.83	4.46
4	C 2	12	9.91	3.67	16.08	3.02
5	C 1	15	10.60	3.11	15.06	4.94
6	C 1	9	11.55	1.01	15.22	3.07
7	C 1	8	10.00	2.61	14.12	2.41
TOTAL EXPERIMENTAL			8.56	4.61	13.41	3.02
TOTAL CONTROL			10.50	2.88	15.20	3.67
ALL GROUPS COMBINED			9.56	3.91	14.34	3.47

STANFORD-ACHIEVEMENT SUBTEST 2

Paragraph Meaning

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	7.30	6.23	13.84	4.61
2	E 2	16	11.93	3.75	15.37	2.09
3	E 2	12	13.41	1.31	15.66	0.77
4	C 2	12	13.75	1.91	17.00	2.79
5	C 1	15	12.53	1.59	15.86	5.50
6	C 1	9	13.77	1.56	16.33	1.87
7	C 1	8	12.87	1.55	14.75	2.37
TOTAL EXPERIMENTAL			10.90	4.89	14.97	2.97
TOTAL CONTROL			13.18	1.71	16.06	3.74
ALL GROUPS COMBINED			12.08	3.77	15.54	3.41

STANFORD-ACHIEVEMENT SUBTEST 3

Vocabulary

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S. D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	11.07	3.47	13.46	2.14
2	E 2	16	11.37	3.57	15.37	3.05
3	E 2	12	13.00	1.59	13.16	1.40
4	C 2	12	12.66	1.07	14.58	1.78
5	C 1	15	11.73	3.12	14.86	2.61
6	C 1	9	12.66	1.93	16.22	3.07
7	C 1	8	11.87	1.12	14.50	2.07
TOTAL EXPERIMENTAL			11.75	3.12	14.12	2.54
TOTAL CONTROL			12.20	2.14	15.00	2.43
ALL GROUPS COMBINED			11.98	2.65	14.57	2.50

STANFORD-ACHIEVEMENT SUBTEST 4

Spelling

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	0.0	0.0	10.00	6.28
2	E 2	16	0.0	0.0	14.50	7.32
3	E 2	12	0.0	0.0	12.00	7.38
4	C 2	12	4.50	5.61	17.50	6.59
5	C 1	15	1.40	3.69	16.00	9.89
6	C 1	9	2.22	4.41	15.77	7.51
7	C 1	8	2.75	5.09	11.00	7.32
TOTAL EXPERIMENTAL			0.0	0.0	12.40	7.12
TOTAL CONTROL			2.65	4.68	15.45	8.20
ALL GROUPS COMBINED			1.37	3.60	14.00	7.81

STANFORD-ACHIEVEMENT SUBTEST 5

Word Study Skills

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	10.23	4.18	14.07	2.21
2	E 2	16	10.87	3.11	15.37	3.94
3	E 2	12	12.08	1.08	14.08	1.78
4	C 2	12	12.58	0.66	16.33	3.75
5	C 1	15	11.60	1.76	17.13	4.77
6	C 1	9	11.33	2.50	18.44	5.48
7	C 1	8	11.87	0.64	13.50	2.92
TOTAL EXPERIMENTAL			11.02	3.12	14.58	2.93
TOTAL CONTROL			11.86	1.60	16.52	4.54
ALL GROUPS COMBINED			11.45	2.48	15.58	3.95

STANFORD-ACHIEVEMENT SUBTEST 6

Arithmetic

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Spring 1970 (POST) Mean	S.D.
1	E 1	13	9.15	2.82	13.00	2.12
2	E 2	16	9.00	2.75	14.56	3.01
3	E 2	12	10.91	0.66	13.83	2.82
4	C 2	12	10.50	1.93	15.16	3.21
5	C 1	15	10.53	1.99	16.26	3.05
6	C 1	9	10.55	2.35	17.11	3.37
7	C 1	8	10.12	2.64	13.62	4.06
TOTAL EXPERIMENTAL			9.61	2.46	13.85	2.71
TOTAL CONTROL			10.45	2.10	15.65	3.45
ALL GROUPS COMBINED			10.04	2.31	14.78	3.22

STANFORD-ACHIEVEMENT TEST

TOTAL

Class ID Number	GROUP:	N:	Fall 1969 (PRE) Mean	S.D.	Mean Age	S.D.	Spring 1970 (POST) Mean	S.D.	Mean Age	S.D.
1	E 1	13	43.69	12.93	76.30	1.84	76.53	14.68	83.33	1.71
2	E 2	16	51.68	12.52	75.56	1.78	89.43	19.36	82.56	1.78
3	E 2	12	61.00	5.25	76.91	2.10	81.58	13.27	83.91	2.10
4	C 2	12	63.91	8.55	78.16	1.94	96.66	17.09	84.16	1.94
5	C 1	15	58.40	11.13	76.33	2.09	95.20	27.01	83.26	2.05
6	C 1	9	62.11	6.19	76.00	2.06	99.00	21.28	83.00	2.06
7	C 1	8	59.50	8.15	75.50	1.69	81.50	17.18	82.50	1.69
TOTAL EXPERIMENTAL			51.87	12.78	76.19	1.93	83.04	16.86	83.22	1.90
TOTAL CONTROL			60.86	9.08	76.61	2.15	93.88	21.94	83.31	1.98
ALL GROUPS COMBINED			56.52	11.84	76.41	2.05	88.65	20.28	83.27	1.93